

ABSTRACT

The problem of stress transmission from the outside of an integrated circuit package into the interior of the semiconductor has been significantly reduced by placing a micro-spring between the external solder ball and the interior tab. The process for manufacturing such a structure begins with a fully completed integrated circuit on whose surface freestanding metal posts are formed, each post being in contact with an I/O pad. Using a leveling plate at elevated temperature, the posts are given a permanent tilt relative to the surface and are then encapsulated in an elastomer. This subprocess may then be repeated as many times as desired with the direction in which the posts lean being changed by 90 degrees at each iteration. This results in the formation of an orthogonal spiral which acts as a coil spring to absorb stress originating at the solder ball.